



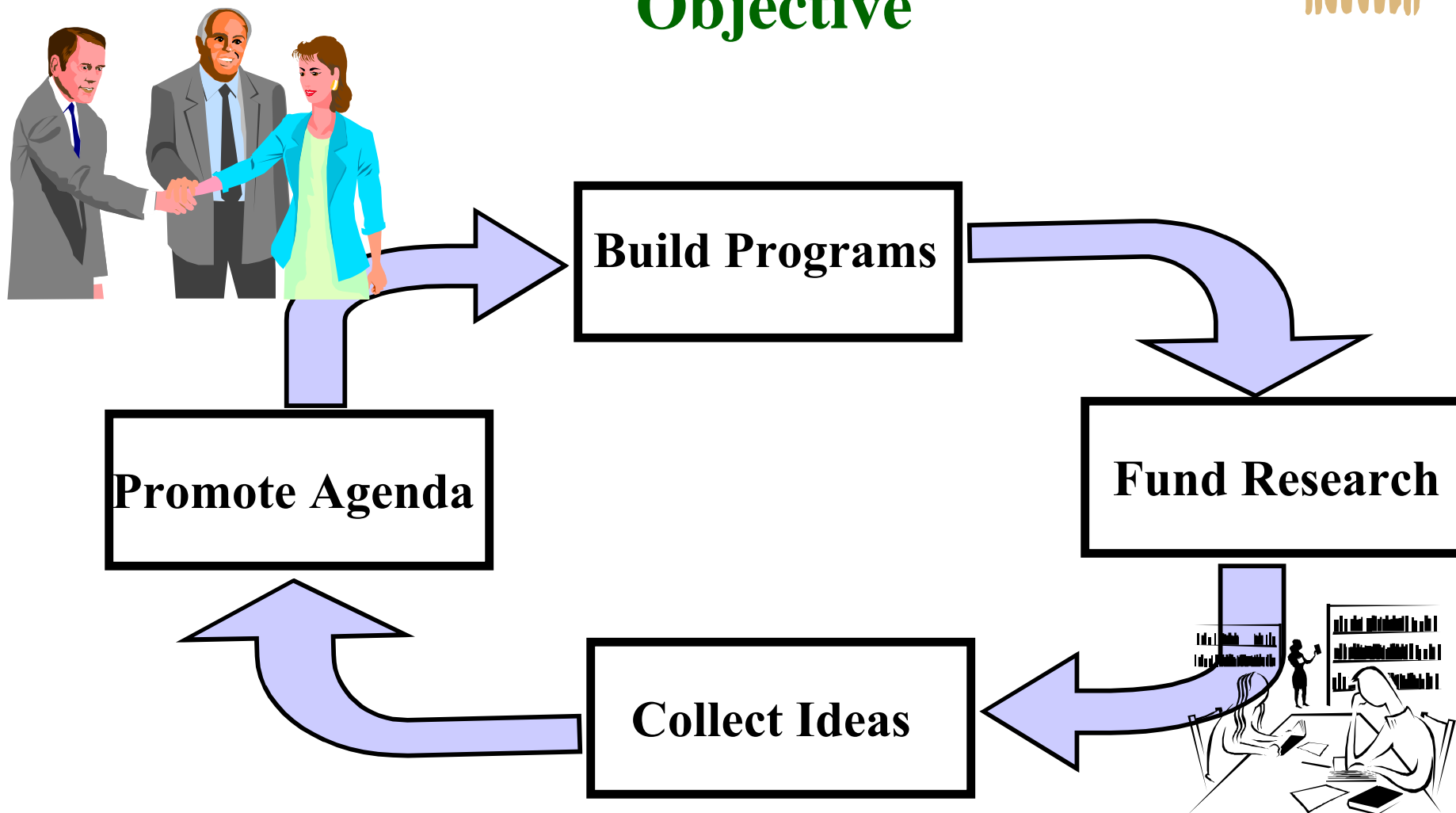
# **Software Design and Productivity Workshop**

## **WELCOME**

**Frank Anger, NSF**



## Objective



# Deliverables

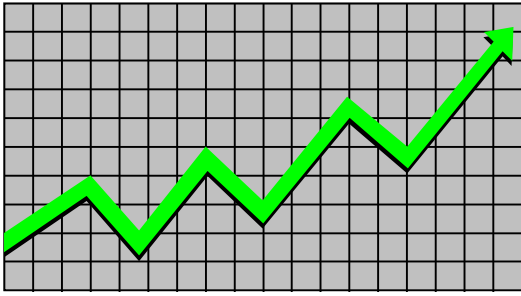


- How should the federal government spend \$5 billion in software research over 10 years?
- If we can build super-colliders and send rockets to Mars, we can support almost any kind of research, development, infrastructure, testbeds, human development, education, ...
- Specific, sellable ideas that can lead to research themes
- What you are ready to do now--where are strengths
- What you dream to do in 10 years--what are challenges



## PITAC

- Presidential Information Technology Advisory Committee
- Major Recommendation:  
“Make **fundamental software research** an absolute priority”
- Four major research priorities:
  - **Software**
  - Scalable Information Infrastructure
  - High-End Computing (including software R&D)
  - Socio-Economic & Workforce Impacts



## PITAC



- Software Research: Findings
  - **Software demand exceeds Nation's ability to produce**
  - Nation depends on fragile software
  - Technologies to build reliable & secure software inadequate
- Software Research: Recommendations
  - Fund fundamental research in software design methods & component technology
  - Make software research substantive component of every major IT research initiative



## What Next?

- What are the fundamental problems?
  - **NOT** making Java secure or UML sound and consistent
- What are the real barriers and challenges?
  - **NOT** attaining absolute security and assurance
- What are the most promising directions?
  - **NOT** creating the ultimate formal specification notation
- What is the ideal outcome?
  - **NOT** infinite productivity at zero quality
- How should software research be pursued?
  - **NOT** as a theoretical *tour de force*; NOT slash & build



## Fundamental Research

- How can we build for change?
- How do we exploit (rather than lament) legacy code?
- How do we architect a cyber world that is not the equivalent of a slum or strip mall?
- What new technologies pose the greatest challenges to our basic assumptions?
- How do we validate/refute our basic assumptions?
- What can we do to lower barriers to technology infusion?
- What science underlies software process and software construction?



**End**